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IV.

CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF
HARVARD COLLEGE.

Presented by Josiah P. Cooke, Director, June 16, 1886.

I.—ANALYSIS OF MICA FROM LEON CO., TEXAS.

By GEORGE W. LEIGHTON, B. S. 1886.

THIS mica, submitted to our examination by Professor Cooke, was received by him from Dr. A. E. Foote, of Philadelphia, who identifies it as the Joakumite of the Texas Academy of Sciences. The mineral attracted notice, as it presented characteristics intermediate between those of the vermiculites and the muscovites, and it was hoped that an analysis might add to our knowledge of the relations between these species.

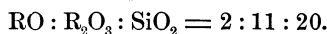
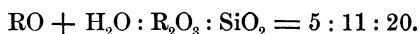
Description.—The mica is opaque except in thin laminæ, and has obviously undergone alteration. Cleavage basal eminent, laminæ flexible, but brittle and non-elastic. Lustre pearly. Color brownish to yellowish green. Double refraction negative. Biaxial; with bisectrix nearly if not absolutely normal to the cleavage, the optical angle in air measuring about $37\frac{1}{2}^{\circ}$, but could not be measured accurately on account of opacity. In blow-pipe flame the laminæ separate, swelling to more than double the original thickness, and melting on the edges, showing fusibility 5–6. Blow-pipe flame strongly colored with potash, barely tinged with soda, and with traces of lithia. No fluorine could be detected by the usual tests.

The Analysis was made in the usual way, fusing with Na_2CO_3 for the silica, decomposing with HF for the alumina, iron, and magnesia, and by Lawrence Smith's method for the alkalis. The iron was all in the ferric condition, and was determined volumetrically after weighing Al_2O_3 and Fe_2O_3 together. The potash was weighed as chloroplatinate, and the water was determined by ignition. In the following table, the results of our analysis are given in Column I. In Column II. are the corresponding per cents of oxygen, and in Column III.

are given for comparison the results of an analysis of a mica from Hirschburg, taken from Dana's System of Mineralogy, last edition, and classed by him among the muscovites.

	I.	II.	III.
SiO ₂	48.95	26.11	49.04
Al ₂ O ₃	25.17	11.73	29.01
Fe ₂ O ₃	9.40	2.82	5.56
MgO	1.69	0.67	0.75
CaO	trace.	. . .	0.17
Na ₂ O	trace.	. . .	0.50
K ₂ O	11.08	1.88	11.19
H ₂ O	4.31	3.83	4.65
	<u>100.60</u>		<u>100.87</u>

Oxygen Ratios. — Bases with water to silica are as 4 : 5 nearly. Bases without water to silica are as 2 : 3 approximately.



Conclusions. — Here, then, we have an evident product of alteration, with some of the characters of a vermiculite, which differs in composition from ordinary muscovite mica only in the absence of fluorine, and the presence of a somewhat larger amount of magnesia. Possibly muscovite may pass into vermiculite, and this mica from Texas may represent the first step in the alteration; but if so, intermediate stages must be found, and then this work may help to answer the question. As will be seen, the composition of the Texas mica agrees closely with that of the mica from Hirschburg, the difference in the relative amounts of Al₂O₃ and Fe₂O₃ being unessential.

II.—ANALYSIS OF A CRYSTALLINE SCALE FORMED IN THE MANUFACTURE OF SODIC BICARBONATE BY THE AMMONIA PROCESS, AT SYRACUSE, N. Y.

BY GEORGE W. LEIGHTON, B. S. 1886.

THE material here described was deposited on the inner surface of an iron tank in which vapors consisting of NH₃, CO₂, with small quantities of H₂S, are passed through brine holding in solution NaCl, MgCl₂.